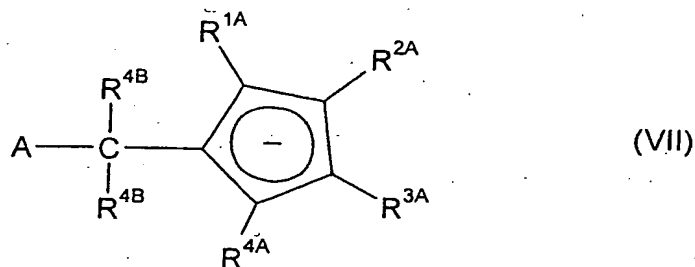


11. A process for preparing polyolefins by polymerization or copolymerization of olefins in the presence of a catalyst system as claimed in claim 8 or 9.
12. A process for preparing cyclopentadienyl system anions of the formula (VII),



where the variables have the following meanings:

$R^{1A}$ - $R^{4A}$  are each, independently of one another, hydrogen,  $C_1$ - $C_{20}$ -alkyl,  $C_2$ - $C_{20}$ -alkenyl,  $C_6$ - $C_{20}$ -aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part,  $NR^{6A}_2$ ,  $N(SiR^{6A}_3)_2$ ,  $OR^{6A}$ ,  $OSiR^{6A}_3$ ,  $SiR^{6A}_3$  where the organic radicals  $R^{1A}$ - $R^{4A}$  may also be substituted by halogens and two vicinal radicals  $R^{1A}$ - $R^{4A}$  may also be joined to form a five- or six-membered ring, and/or two vicinal radicals  $R^{1A}$ - $R^{4A}$  are joined to form a heterocycle which contains at least one atom from the group consisting of N, P, O and S,

$R^{6A}$  are each, independently of one another, hydrogen,  $C_1$ - $C_{20}$ -alkyl,  $C_2$ - $C_{20}$ -alkenyl,  $C_6$ - $C_{20}$ -aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part and two geminal radicals  $R^{6A}$  may also be joined to form a five- or six-membered ring,

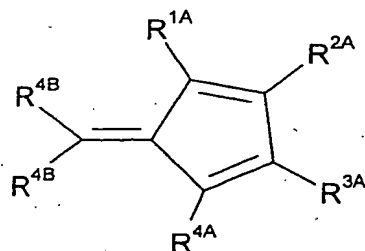
A is an unsubstituted, substituted or fused, heteroaromatic ring system,

$R^{4B}$  are each, independently of one another, hydrogen,  $C_1$ - $C_{20}$ -alkyl,  $C_2$ - $C_{20}$ -alkenyl,  $C_6$ - $C_{20}$ -aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part or  $SiR^{3B}_3$ , where the organic radicals  $R^{4B}$  may also be substituted by halogens and two geminal or vicinal radicals  $R^{4B}$  may also be joined to form a five- or six-membered ring and

$R^{3B}$  are each, independently of one another, hydrogen,  $C_1$ - $C_{20}$ -alkyl,  $C_2$ - $C_{20}$ -alkenyl,  $C_6$ - $C_{20}$ -aryl or alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part and two radicals  $R^{3B}$  may also be joined to form a five- or six-membered ring,

which comprises the step a) or a'), where,

in step a), an A<sup>-</sup> anion is reacted with a fulvene of the formula (VIIIa)



(VIIIa)

or,

in step a'), an organometallic compound  $R^{4B}M^BX^B$ , where  $M^B$  is a metal of group 1 or 2 of the Periodic Table of the Elements,

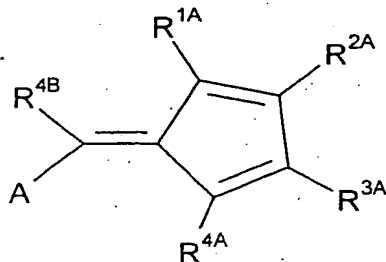
$X^B$  is halogen,  $C_1-C_{10}$ -alkyl, alkoxy having from 1 to 20 carbon atoms in the alkyl radical and/or from 6 to 20 carbon atoms in the aryl radical, or  $R^{2B}$ ,

$R^{2B}$  is hydrogen,  $C_1-C_{20}$ -alkyl,  $C_2-C_{20}$ -alkenyl,  $C_6-C_{20}$ -aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part or  $SiR^{3B}_3$ , where the organic radical  $R^{2B}$  may also be substituted by halogens and  $R^{2B}$  and A may also be joined to form a five- or six-membered ring,

$R^{3B}$  are each, independently of one another, hydrogen,  $C_1-C_{20}$ -alkyl,  $C_2-C_{20}$ -alkenyl,  $C_6-C_{20}$ -aryl or alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part and two radicals  $R^{3B}$  may also be joined to form a five- or six-membered ring and

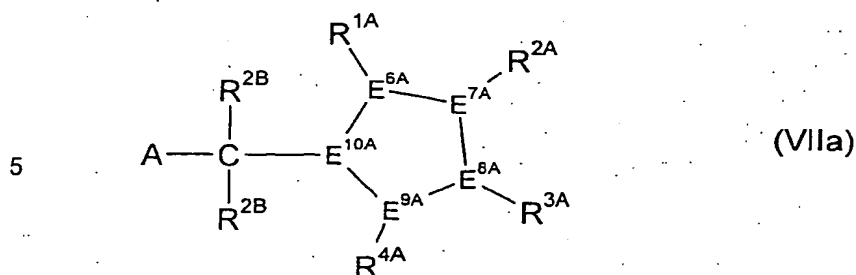
b is 0 when  $M^B$  is a metal of group 1 of the Periodic Table of the Elements and is 1 when  $M^B$  is a metal of group 2 of the Periodic Table of the Elements,

is reacted with a fulvene of the formula (VIIIb):



(VIIIb)

13. A process for preparing cyclopentadiene systems of the formula (VIIa)



where the variables have the following meanings:

10

$E^{6A}-E^{10A}$  are each carbon, where in each case four adjacent  $E^{6A}-E^{10A}$  form a conjugated diene system and the remaining  $E^{6A}-E^{10A}$  additionally bears a hydrogen atom,

15

$R^{1A}-R^{4A}$  are each, independently of one another, hydrogen,  $C_1-C_{20}$ -alkyl,  $C_2-C_{20}$ -alkenyl,  $C_6-C_{20}$ -aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part,  $NR^{6A}_2$ ,  $N(SiR^{6A}_3)_2$ ,  $OR^{6A}$ ,  $OSiR^{6A}_3$ ,  $SiR^{6A}_3$ , where the organic radicals  $R^{1A}-R^{4A}$  may also be substituted by halogens and two vicinal radicals  $R^{1A}-R^{4A}$  may also be joined to form a five- or six-membered ring, and/or two vicinal radicals  $R^{1A}-R^{4A}$  are joined to form a heterocycle which contains at least one atom from the group consisting of N, P, O and S,

20

$R^{6A}$  are each, independently of one another, hydrogen,  $C_1-C_{20}$ -alkyl,  $C_2-C_{20}$ -alkenyl,  $C_6-C_{20}$ -aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part and two geminal radicals  $R^{6A}$  may also be joined to form a five- or six-membered ring,

25

A is an unsubstituted, substituted or fused, heteroaromatic ring system,

30

$R^{2B}$  are each, independently of one another, hydrogen,  $C_1-C_{20}$ -alkyl,  $C_2-C_{20}$ -alkenyl,  $C_6-C_{20}$ -aryl, alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part or  $SiR^{3B}_3$ , where the organic radicals  $R^{2B}$  may also be substituted by halogens and  $R^{2B}$  and A may also be joined to form a five- or six-membered ring,

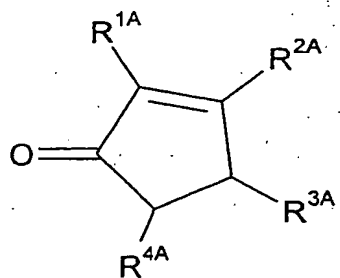
35

$R^{3B}$  are each, independently of one another, hydrogen,  $C_1-C_{20}$ -alkyl,  $C_2-C_{20}$ -alkenyl,  $C_6-C_{20}$ -aryl or alkylaryl having from 1 to 10 carbon atoms in the alkyl part and 6-20 carbon atoms in the aryl part and two radicals  $R^{3B}$  may also be joined to form a five- or six-membered ring,

40

which comprises the following step:

a'') reaction of an  $A-CR^{2B}R^{2B-}$  anion with a cyclopentenone system of the formula (IX)



(IX)